

## A HYPERGAME ANALYSIS OF THE BATTLE OF MAGERSFONTEIN

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### ABSTRACT

The battle of Magersfontein, 11 December 1899, can be modelled as a hypergame. The analysis shows how British misconceptions of the Boer strategies and strength led to an ill-advised British attack with disastrous results for them. Several points in connection with hypergames are illustrated in this case study.

### 1. INTRODUCTION

P.G. Bennett and M.R. Dando's case study of the fall of France in the Second World War [1] is a landmark in the development of the theory and applications of hypergames. One of the points made in their study is that a major cause of the Allies' defeat lay in an overly simplistic view of the problem in which they assumed that the enemy perceived the military situation the same way as they did themselves. On the other hand the more imaginative of the German commanders were aware of the differences between the two sides' perceptions and put this awareness to devastating use.

The battle of Magersfontein, 11 December 1899, provides another example of such a situation. This battle in the Boer War is interesting enough in itself to warrant its own case study. In comparison with Bennett and Dando's study it also brings out the point more clearly that the preference orderings of the possible outcomes may vary considerably when evaluated from different viewpoints. Nevertheless the techniques used are the same as in Bennett and Dando's case study.

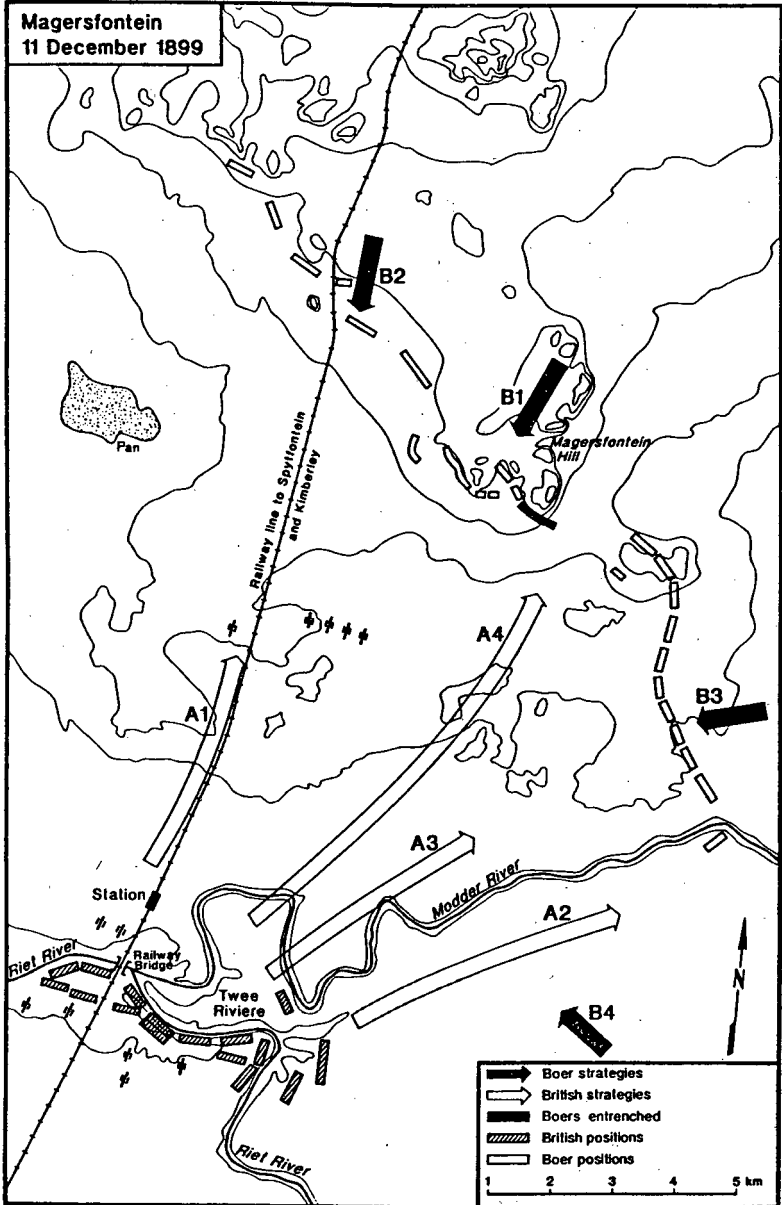


Figure 1 : Possible strategies in the battle of Magersfontein

## 2. ANALYSIS

Early in December 1899 the British troops, in their advance on Kimberley, had crossed the railway line just north of the Modder River. The Boer forces were deployed in a line from north to east on both sides of the nearby Magersfontein Hill. Magersfontein Hill rises abruptly from the veld and, although only 55 m above the surrounding ground, dominates the countryside for many kilometers in all directions.

On the eve of the battle the British commander, Lord Methuen, formulated his military options in terms of the following possible strategies

- A1: Attack along the railway line to Kimberley;
- A2: Execute a flank march to the east to Abon's Dam and thence attack Spytfontein, north of Magersfontein Hill
- A3: Assault the left flank of the Boers
- A4: Storm Magersfontein Hill and capture the Boer positions in a short, sharp bayonet attack

A fifth option, to pass further west of Magersfontein and attack Spytfontein, was discarded because the country was so waterless as to preclude any attempt in that direction.

The British perception of the Boer strategies was as follows :

- B1: Attack from the top of Magersfontein Hill
- B2: Concentrate defence on the railway line
- B3: Counterattack by the Boer left wing
- B4: Attack Modder River camp with a small force from the south

The strategies as discussed above are also shown on the map in Figure 1.

With this background the preference matrix as seen by the British could be as in Figure 2.

		Boers Concentrate on				
		Hill B1	Railway B2	Left flank B3	South B4	
British	Railway	A1	2;15	6;11	10;7	14;3
	March east	A2	9;8	5;12	7;10	1;16
	Attack left flank	A3	4;13	8;9	3;14	12;5
	Attack hill	A4	15;2	11;6	13;4	16;1

Figure 2 : British perception of the military situation

There are 16 strategy pairs of the form  $(A_i; B_j)$ . An entry such as  $(a_i; b_j)$  in the matrix denotes that from the British viewpoint the outcome for the strategy pair  $(A_i; B_j)$  has a preference ordering of  $a_i$  for the British and  $b_j$  for the Boers. The highest ordering is 16 and the lowest 1. For convenience it is assumed that the British ordering from the British viewpoint is the opposite of that of the Boers' ordering from the British viewpoint.

The choice of preference orderings is subjective but hopefully not illogical. It is based on historical analyses (for example Breytenbach [2], Duxbury [4], Maurice [5] and Pakenham [6]) and eyewitness accounts (for example Totius [8] and those mentioned in Davitt [3] and Spies [7]). For example, the British ranking of the entries in the row for A4 in Figure 2 can be motivated as follows. The capture of Magersfontein Hill was very important from the British viewpoint. It was their intention to march on the Hill during the night and execute a surprise attack at first light. Rumour had it that the Boers feared and despised the bayonet because they regarded it as a barbaric weapon (Duxbury [4]). The British evaluation of the Boer psychology and positions explains their optimistic view of the possibilities in row A4 and in particular of the outcome when the Boers concentrate their defence on Magersfontein Hill. If the Boers were really concentrating on the south the victory would be even easier and the resulting tactical situation even better for the British. From the geographical positions indicated in Figure 1 it is clear that more resistance could be expected if the Boers were concentrating on their own left flank, but that this would be less if they were in fact concentrating on the railway line.

The game matrix has a unique stable solution for the strategy pair  $(A_4; B_2)$  in the sense that neither of the two sides would obtain a better ordering if it should decide unilaterally to change its strategy. For example, if the British are committed to A4 but the Boers change their strategy, none of the other preference orderings of 2, 4 or 1 are better than the preference ordering of 6 for them for the strategy pair  $(A_4; B_2)$ . Similarly, if the Boers are committed to B2 but the British change their strategy, none of the other preference orderings of 6, 5 or 8 are better than the preference ordering of 11 for them for the stable solution. The stable solution indicates that the British forces should attack Magersfontein Hill and that the Boers should concentrate their defence on the railway line.

This British viewpoint was defective on various counts. In the first place their estimate of the strength of the Boer forces was approximately 50% too high. In the second place they did not notice several weak spots on Boer left flank. Their biggest mistake was that they missed an important Boer strategy, namely the use of trenches. At the insistence of General Koos de la Rey they had prepared a number of trenches, the most important of which were those just south of Magersfontein Hill. Because of a number of reasons the presence of these trenches was not discovered by the British before the battle.

Because of the three factors mentioned above the Boers' perception of the military situation differed from those of the British. In terms of a hypergame analysis this can be modelled in two ways. In the

first place the modeller can use different preference orderings for the Boers' perception of the outcomes of the various strategy pairs. In the second place the Boers' game matrix can be expanded to include a strategy (not shown explicitly in Figure 1) which does not occur in the British game matrix, namely :

**B5 :** Concentrate defence on the trenches at the foot of Magersfontein Hill

A plausible game matrix according to the Boers' perception is given in Figure 3. The strategy pair (A3; B5) in the new game matrix is a stable solution which provides a fairly satisfactory military outcome for the Boer forces. On the other hand the Boers had devised their strategy B5 precisely because of its element of surprise. When the British launched a great military barrage on the ridge of Magersfontein Hill on 10 December the Boers had every reason to believe that their trenches had not been detected and that they could therefore exploit this information in their planning.

		Boers Concentrate on					
		Hill B1	Railway B2	Left flank B3	South B4	Trenches B5	
British	Railway	A1	2;15	4;13	10;7	14;3	3;14
	March east	A2	5;12	3;14	8;9	1;16	5;12
	Attack left flank	A3	6;11	9;8	7;10	11;6	6;11
	Attack hill	A4	15;2	13;4	12;5	16;1	0;17

Figure 3 : Boer perception of the military situation

The model in Figure 3 has the capacity to illustrate these aspects. If the column for B5 is removed from consideration the remaining game matrix has a stable solution for the strategy pair (A4; B3), which from the Boer viewpoint is not as advantageous as (A3; B5). Nevertheless the model shows that the British will select A4 if they are not aware of B5. Therefore the Boers select B5 in the expanded matrix, and against A4 this yields the best possible outcome for them.

The run of events in the real battle was that the British indeed chose A4 and the Boers B5, resulting in a terrible defeat for the British. A poignant counterpoint to the basic theme of misconception and war is provided by the little-known fact that the famous Afrikaans poet and theologian, Totius (J D du Toit), who was in the Boer camp, directed his scripture reading from 2 Corinthians 5 and his sermon on the eve of the battle to the subject of reconciliation (Totius [8]).

### 3. CONCLUSION

Hypergame analyses are useful in situations where the conflicting parties have different perceptions of the strategies available to them and the payoffs that result from their interactions. The battle of Magersfontein illustrates these points and serves as a grim reminder of the dire consequences that can result when a participant in a conflict fails in his evaluation of his opponent.

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